

TITLE OF THE INVENTION

Open five-piece container with bail bar arrangements

5 FIELD OF THE INVENTION

The present invention pertains to a container formed of a bottom piece and a pair of opposite side pieces and a pair of opposite end pieces which are hingedly foldable onto the bottom piece. More particularly, the present invention pertains to such container having a pair of bail bar arrangements to reinforce the open
10 container when the side pieces and end pieces are in the erected position.

Five-piece open containers are well-known and comprise a bottom piece formed of plastics material and four side pieces also formed of plastics material and pivotally mounted to the bottom piece so that the side pieces may be pivotally
15 moved between an erected position and a non erected folded position.

The upper corner of each piece is provided moving parts which are integral with the side pieces and which enable the side pieces to be secured in an erected inter-engagement. One example of such container may be found described in
20 applicant's U.S. patent No. 5,515,987 issued May 14, 1996. Some five-piece open containers comprise side pieces which are much longer than the end pieces; hence, the side pieces may be subjected to flexing when similarly constructed containers are stacked one above the other. One example of such open container may be found described in applicant's Canadian patent No.
25 2,202,119 issued May 23, 2000.

OBJECTS AND STATEMENT OF THE INVENTION

It is an object of the present invention to provide an open five-piece container
30 wherein the side pieces are prevented to flex under heavy loads.

This is achieved by providing a five-piece open container with a pair of pivotable bail bar arrangements which further secure the container in its erected position,

especially when similarly constructed containers are stacked one on top of the other.

5 It is also an object of the present invention to provide such container with a pair of bail bar arrangements wherein one side piece of the erected container may be outwardly open to give access inside the container when in a stacked formation with other similarly constructed containers.

This is achieved by providing a container which comprises:

10 a bottom piece having opposite side edges and opposite end edges;

a pair of opposite side pieces, each having an upper edge and a lower edge, the lower edge hingedly connected to an associated side edge of the bottom piece;

15 a pair of opposite end pieces, each having an upper edge and a lower edge, the lower edge being hingedly connected to associated end edge of the bottom piece;

latching means for securing the side pieces and the end pieces to one another in a vertical condition so as to form an open five-piece container;

20 a pair of bail bar arrangements having one end hingedly connected to the upper edge of the end pieces and an opposite end;

the upper edges of the side pieces having lodging means receiving opposite end portions of the opposite end of the bail bar arrangement;

25 whereby the bail bar arrangements are pivotable between a first position wherein the bail bar arrangements rests substantially horizontally on the side pieces to reinforce the side pieces and a second position substantially parallel to outer faces of the end pieces.

30 In one form of the invention, each bail bar arrangement consists of a π -shaped configuration consisting of two-parallel arms having one end hingedly connected to an end piece and an opposite end formed of a transverse rod having its opposite ends engaged in the upper edge of the side pieces.

It is a further object of the present invention to provide a container with foldable side pieces and end pieces equipped with a bail bar arrangement so configured that, when the end pieces and side pieces are inwardly folded to lie in a plane substantially parallel to the plane of the bottom piece, the bail bar arrangement
5 will also lie in a substantially similar parallel plane to the bottom piece.

Other objects and further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. It should be understood, however, that this detailed description, while indicating preferred
10 embodiments of the invention, is given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art.

15 **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a perspective view of a container made in accordance with the present invention;

Figure 2 is an enlarged perspective view showing the connection of one end of
20 the bail arrangement;

Figure 3 is an enlarged perspective view showing the connection of an opposite end of the bail arrangement;

25 Figure 4 is a cross-sectional view showing one end of the container with its bail-bar arrangement in accordance with the present invention;

Figure 5 is a perspective view showing the container in the non-erected condition;

30 Figure 6 is a perspective view, similar to that shown in figure 3, showing the bail bar arrangement lying substantially in the plane of the end pieces; and

Figure 7 is a perspective exploded view showing a cross stacking arrangement of containers made in accordance with the present invention.

5 DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to figure 1, there is shown a five-piece open container, generally denoted 10, made entirely of rigid plastics material. The container essentially consists of a bottom piece 12, a pair of opposite side pieces 14 and 16 and a pair of opposite end pieces 18 and 20. To facilitate the manual handling of the container, each opposite side piece displays an elongated opening 22, 24 and each opposite end piece displays an elongated opening 26, 28. The structural appearance of the five pieces of the container is conventional, consisting of reinforcing ribs to provide rigidity while a plurality of openings provide lightness (and, in certain cases, aeration to products therein).

15 The side pieces and end pieces are hingedly connected to the bottom piece along the lower edge thereof. A detailed construction of the connection of the lower edges of the side and end pieces to the sides and ends of the bottom piece will not be described as it does not form part of the present invention; however, reference may be made to applicant's U.S. patent No. 5,515,987 issued May 14, 20 1996 for an understanding of its construction. The advantage of such construction is that no metallic parts are used for the connection of the side and end pieces to the bottom piece.

25 Similarly, the corners of the upper part of the side and end pieces are provided with latching means for securing the end pieces and the side pieces to one another in a vertical erected condition so as to form an open five-piece container. Again, a detailed construction of the latching means will not be described as it does not form part of the present invention. However, reference may be made 30 to applicant's above mentioned U.S. patent. The advantage of such latching construction is that quick connection and disconnection can be effected to move the container from an erected condition to a non-erected condition, or vice-versa, as illustrated in the drawings.

The present invention is particularly concerned with further securing the side and end pieces to one another in their erected position, especially in those cases where the side pieces are much longer than the end pieces. The invention therefore provides a pair of bail bar arrangements, generally denoted 40, 42
5 which are of identical construction (hence, it is considered unnecessary to describe each one separately). Thus, referring to the bail bar arrangement 40, it consists of a π -shaped construction consisting of a pair of arms 44 and 46, each having one end pivotally mounted at the upper edge of the end piece 18 (see figure 2) and an opposite end integrally fixed to a transverse rod 48 (see
10 figure 3). The opposite ends 50 and 52 of rod 48 are engaged in correspondingly shaped recesses (one being shown in figure 3 as 53) at the upper edges of the side pieces 14 and 16.

Figure 4 shows that the arm 44 of the bail bar arrangement 40 is pivotable (as
15 indicated by arrow 54) to a substantially horizontal position to engage the recess in the upper edge of the side piece 14. Arm 44 is also pivotable to a position substantially parallel to the outer wall of the end piece 18 (see figure 5).

As can be seen in figures 1 and 2, the arms 44, 46 have a T-shaped end 56, 58
20 engaging reinforcing ribs in the side wall on the end piece 18. The geometry of the extremities of the arms 44, 46 is such that the pin can be forced into a snap-in engagement to the ribs of the end piece as a result of the use of flexible plastic material for the entire container. Similarly, and for the same reasons, the
25 opposite end 50 of the transverse rod 48 has a circular portion 52a between rib positions 52b and 52c which may be snapped in engagement in their corresponding recess 53 at the upper edge of the side piece 14. The rib positions 52b and 52c limit lateral movement of the long side piece 16. A similar arrangement is provided on the opposite end 50 for the long piece 14.

30 Figure 5 shows the five-piece container in the folded condition with the side pieces 14 and 16 lying over the bottom piece 12 and the end pieces 18 and 20 lying horizontally over the folded side pieces 14 and 16. Figure 5 shows the bail bar arrangements 40 and 42 in a position lying substantially parallel to the plane

of their respective end pieces 18 and 20. On the other hand, figure 6 which 4 is a view similar to that of figure 5 shows, however, the bail bar arrangements 40 and 42 lying substantially in a plane including the plane of the end pieces 18 and 20 and over the side piece 14. Hence, the rotation of the bail bar, whether lying
5 on an end side piece or in a plane extending on the prolongation of the end piece does not affect the collapsing height. For the collapsing configuration of figure 5, there is sufficient room under the bottom piece to receive the bail bars.

Referring to figure 7, there is shown four similarly constructed containers 10, 10', 10'', 10''' so disposed as to be mounted in a cross wise stacking arrangement.

10 It can be seen that the provision of the bail bar arrangements 40 and 42 of the lower container 10 will prevent the upper containers 10' and 10''' to accidentally slide into the lower container 10.

These containers may also be stacked vertically one above the other. Indeed,
15 it is well known in the art that these containers have upper edges so configured so that they may engaged with correspondingly shaped side and end edges of the bottom piece of a superposed container. However, a detailed construction is not deemed necessary. On the other hand, in such stacked condition, the engagement of the transverse rod of the bail bar arrangements is such that one
20 of the rod end may be snapped-out of engagement from its corresponding recess in the upper edge of one side piece and the latching means at the corners of the side piece with the opposite end piece released so that one side piece may be outwardly moved to provide access to the inside of the container even though forming part of a staked arrangement.

25 In some cases where it may be desired to have access to a product through an end piece of the container, the bail bar is snapped out of its engagement in the recesses 53 and rotated 270° in a position parallel to the end piece. The latching at the corners is removed, the side pieces are flexed towards the inside to
30 disengage the fluides 60 (see figure 2) and the end piece is pivoted outwardly.

Although the invention has been described above with respect to one specific form, it will be evident to a person skilled in the art that it may be modified and

refined in various ways. It is therefore wished to have it understood that the present invention should not be limited in scope, except by the terms of the following claims.